Statistics in focus

ENVIRONMENT AND ENERGY

1/2007

Environment

Author

Nancy STEINBACH

Contents

Manuscript completed on: 21.12.2006
Data extracted on: 03.08.2006
ISSN 1977-0316
Catalogue number: KS-SF-07-001-EN-C

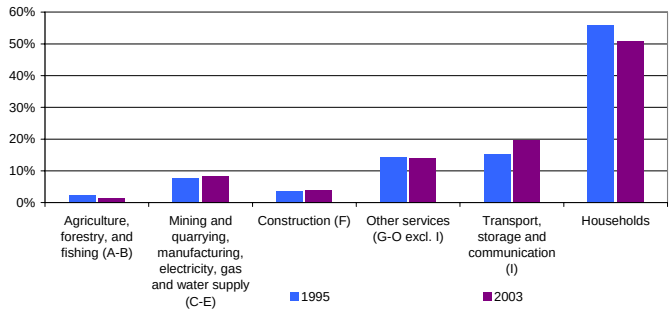
Environmental taxes in the European economy 1995-2003

Environmental taxes have long been an instrument to adjust revenues in national budgets and to some extent serve as an incentive to change the behaviour of citizens by increasing the costs of certain products which have a negative impact on the environment. European efforts such as the Lisbon strategy emphasise that environmental taxes are an important instrument, not only for the protection of the environment but also for competitiveness and growing economies. The green tax reform should lead to decreasing labour taxes and more weight being put on environmental taxes. This Statistics in Focus is the first of its kind to present how environmental taxes are distributed in the economies of Europe and show who the actual tax payer is. Due to data availability only certain Member States, Norway and Bulgaria are presented.

In 2003 energy taxes accounted for 76% of total environmental taxes, transport taxes 21% and pollution and resource taxes shared the rest in the EU-25 Member States. This SIF will therefore focus on energy and transport taxes.

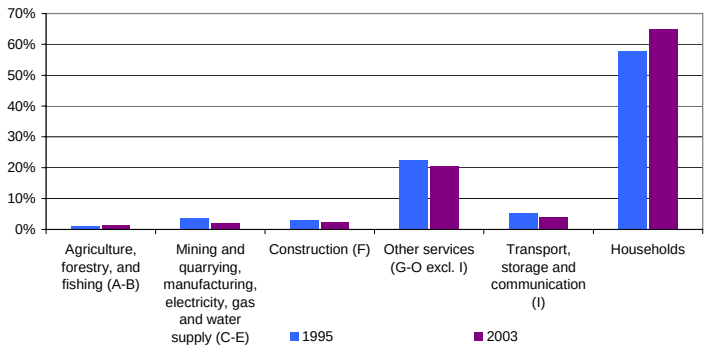
In 2003, households and businesses (NACE A to O) in the EU-15 paid almost equal total amounts of energy taxes. However, businesses account for above 70% of final energy consumption. The share of energy tax paid by households has decreased since 1995 by 5%, shifting the burden slightly to the business sector, mostly to the transport sector. However, households, as well as businesses continue to pay increasing taxes for energy as seen in table 1 in the annex.

Figure 1: EU-15 share of total energy taxes, by industries 1995-2003



Concerning transport taxes in 2003, households in the EU-15 paid 65% of these taxes. During the period 1995 to 2003 the share has increased by 7%. Households and some businesses in EU-15 have overall paid increasing taxes on transport as seen in table 4 the annex.

Figure 2: EU-15 share of total transport taxes, by industries 1995-2003

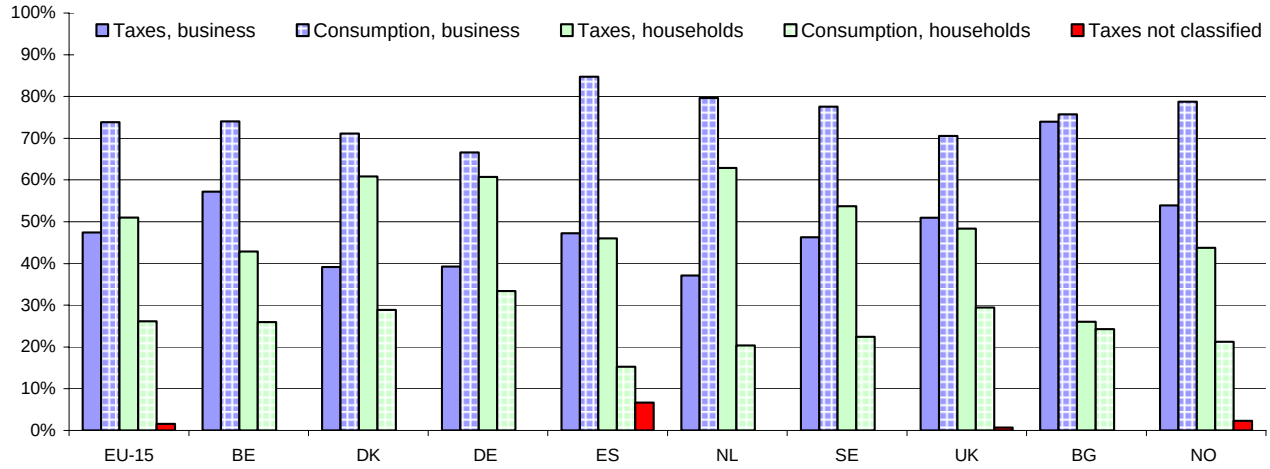


Households pay equal energy taxes to the business community

In 2003 the collection of energy tax added about 202 billion euros to the general economies of governments in the EU-25 (194 billion euros in the EU-15). This is about 5% of total taxes and social contributions collected. Energy taxes are made up of for example excise duties on mineral oils, duties on electricity, coal tax and taxes on gas. Figure 3 presents the share of the business sector and households in total energy taxes. It also presents the share of final energy consumption. In the EU-15 households account for just over 50% of energy taxes paid but their final energy consumption account for just above 26% of total energy consumption.

In Belgium, Spain, United Kingdom, Bulgaria and in Norway it is the business sector that accounts for the majority of energy taxes. In recent years households in the EU-15 have paid an increasing amount of energy taxes in nominal terms as seen in table 1 in annex. However, available income for households has also increased, the largest rise of net disposable income of almost 70% is seen in Norway from 1995 to 2002 (as seen in table 3 in the annex). When comparing energy taxes paid by households with their net disposable income, households in Europe are actually contributing relatively less every year. The exception is the Netherlands, where an increasing share of income goes to paying energy taxes. The share of energy tax paid in net disposable income varies from 4% in Denmark to 1% in Belgium, Spain and Bulgaria.

Figure 3: Share of total energy taxes and share of final energy consumption for business sector and households, 2003

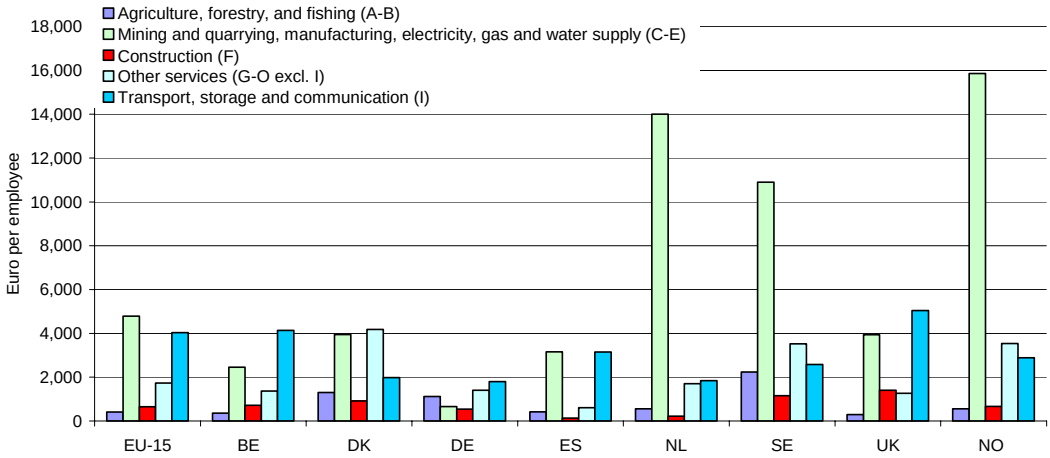


Note: BE 2002, BG 2001, NO preliminary data 2001, DE include energy taxes for transport purposes only 1999. 2003 Final energy consumption is provisional for the EU-15, DE and ES. The statistics on final energy consumption group a range of NACE sectors. Please refer to Methodological Notes.

In 2003 the EU-15 economies employed around 171 million people and their combined Gross Value Added contributed 8 520 billion euros to their gross domestic products. In 2003, in EU-15 energy taxes from the individual economic sectors were 92 billion euros. The largest contributors in the EU-15 Member States are the transport and communication industries (NACE I) who paid 38 billion euros in 2003 (about 42% of total energy taxes paid by businesses) followed by other services (NACE G-O excl I) who paid 27 billion euros. Figure 4 shows that in 2003 in the EU-15 each industry contributed, as an average, from 5 000 euros to just above 400 euros per employee to energy taxes. The Netherlands, Sweden and Norway are far above the EU average for the mining, quarrying, manufacturing and electricity, gas and water supply industries (NACE C-E). These industries pay from 16 000 euros per employee in Norway to 11 000 euros per employee in Sweden.

There are exemptions of certain taxes counted as energy taxes. Most exemptions are in place for reasons of international competitiveness. Within the transport sector is for instance aviation exempted from tax on kerosene and international navigation is normally exempt from different types of energy taxes in the European countries.

Figure 4: Energy taxes, euro per employee, by industry 2003



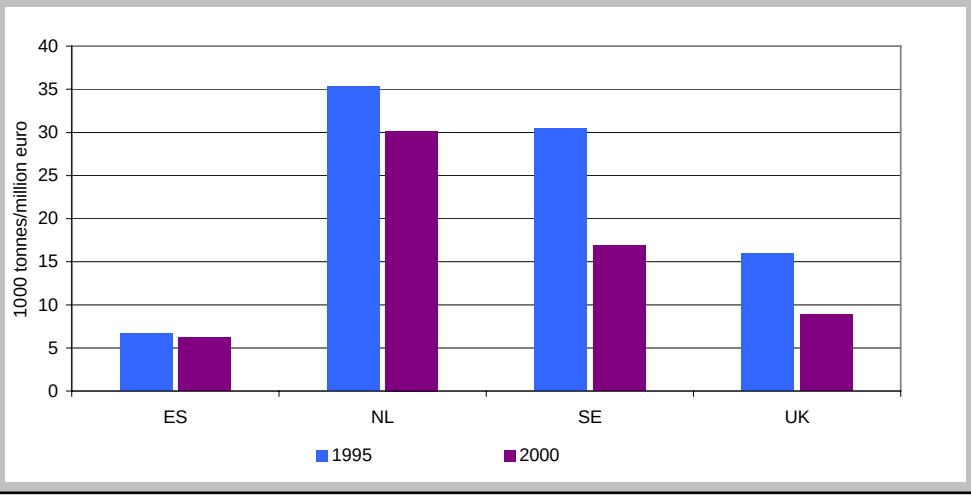
Note: BE 2002, NO preliminary data 2001, DE include energy taxes for transport purposes only 1999

Carbon dioxide emissions increase in the transport and communication sector

Between 1995 and 2002 almost every country presented in figure 4 has seen an increase of carbon dioxide emissions in the transport and communication industries, with the exception of Sweden (no data available for Bulgaria) (see table 5 in the annex). During the same period there has been an increase in the amount of energy taxes levied on this industry, the highest increase of over 100% is seen in the United Kingdom.

Figure 5 shows the intensity of carbon dioxide emissions (CO_2) and energy taxes corrected with deflation. Between 1995 and 2000 the ratio of CO_2 emissions and energy taxes has decreased in the countries presented in the figure, due to the increase of energy taxes levied in these countries. The interlinkage of CO_2 emissions and energy taxes is not straightforward. For example; an increase of energy tax revenue at the same time as CO_2 emissions decrease can be due to at least two possibilities; Firstly a change towards an energy mix that is more heavily taxed. This might lead to reduced energy consumption and therefore reduced CO_2 emissions. Due to a low elasticity of energy demand there would be no decrease of revenues from energy taxes. The second possibility would be a change of energy mix towards energy with lower carbon content, but the tax rate does not take into consideration the carbon content and the revenue would therefore remain stable. For example, in the United Kingdom the tax rate differentiates the level of tax on hydrocarbon fuel based on the carbon content, while the tax rate in Sweden is not proportional to the energy content of fuels.

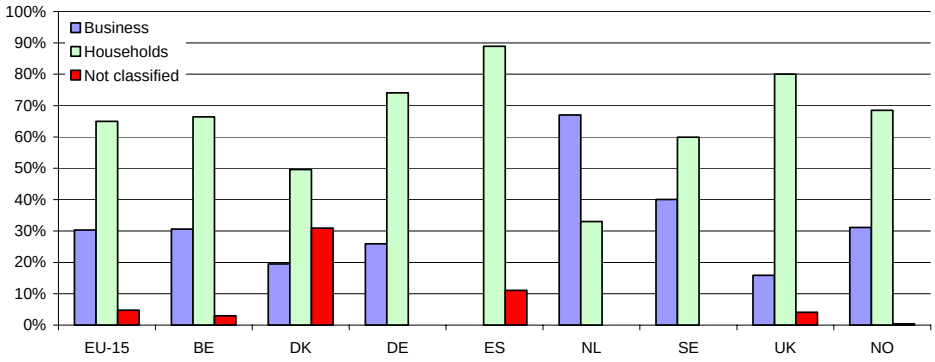
Figure 5: CO_2 emissions by million euro energy taxes, deflated prices



Households pay most of transport taxes

In 2003 transport taxes accounted for 21% of total environmental taxes in the EU-25 of which the EU-15 contributed nearly all. This represents 1.9% of total taxation and social contributions or 56 billion euros (55 billion euros for EU-15). Over 65% of these revenues were raised from households in the EU-15. Figure 6 shows that it is only in the Netherlands that the business community is the largest contributor to transport taxes. Generally taxes on roads, motor vehicle taxes, taxes on registration of motor vehicles and taxes on import of vehicles are included in the statistics. In the United Kingdom for example, the largest item of revenue from transport taxes is due to vehicle excise duty. Taxes paid by households in the EU-15 have increased since 1995 quite substantially but only by a few percent in later years, as seen in table 4 in the annex. When comparing transport taxes paid by households to available income there is a general increase of the share, with the exception of Spain. About 1% of net disposable income goes to transport taxes, with the exceptions of Denmark and Norway, where households pay slightly over 2% of their disposable income in transport taxes.

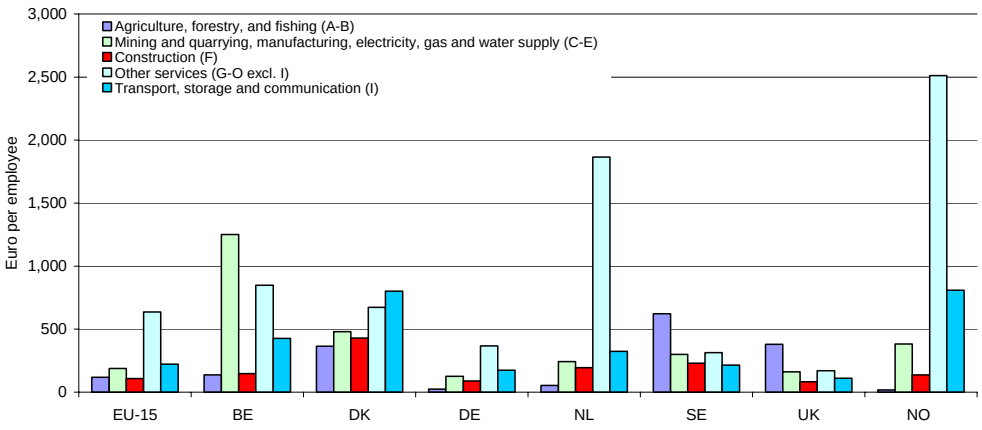
Figure 6: Share of total transport taxes, for business sector and households, 2003



Note: BE 2002, DE 2001, NO preliminary data 2001

Within the EU-15 Member States businesses contribute less than 1 300 euros per employee to transport taxes, as seen in figure 7. In the Netherlands and in Norway other services (NACE G-O excl I) contribute between almost 2 000 euros and 2 500 euros, well above the EU average of 600 euros per employee. In Belgium the mining and quarrying, manufacturing and electricity, gas and water supply industries (NACE C-E) contribute just above 1 200 euros per employee, which is high for the countries presented. Concerning exemptions, these are mainly applicable to public means of transportation. In Belgium and the Netherlands, some agricultural vehicles are exempt from additional road taxes and motor vehicle duty. In Demark electrical vehicles are exempt from registration duty and in Germany and Sweden these types of vehicles are exempt from vehicle taxes for 5 years.

Figure 7: Transport taxes euro per employee, by industry 2003



Note: BE 2002, DE 2001 and NO preliminary data 2001

Annex: Tables

Table 1: Energy taxes 1995-2003, Million euro

Agriculture, forestry, fishing (A-B)	EU-15	BE	DK	DE*	ES	NL	SE	UK	BG	NO**
1995	3,238	:	:	944	304	54	178	96	:	:
2000	2,253	32	:	:	324	195	235	110	20	40
2001	2,208	32	:	:	363	161	201	98	23	50
2002	2,509	33	112	:	407	152	225	101	:	:
2003	2,734	:	116	:	439	154	226	78	:	:
Mining and quarrying Manufacturing, electricity, gas and water supply (C-E)	EU-15	BE	DK	DE*	ES	NL	SE	UK	BG	NO**
1995	11,029	:	:	1,480	492	665	474	2,256	:	:
2000	13,810	98	:	:	807	747	576	3,259	29	522
2001	14,658	99	:	:	868	939	537	3,240	39	529
2002	15,245	99	329	:	908	823	574	3,526	:	:
2003	16,334	:	348	:	944	885	605	3,272	:	:
Construction (F)	EU-15	BE	DK	DE*	ES	NL	SE	UK	BG	NO**
1995	5,229	:	:	1,293	199	113	154	786	:	:
2000	6,188	168	:	:	247	174	230	1,639	14	98
2001	6,091	169	:	:	252	100	230	1,610	16	87
2002	7,338	171	140	:	275	96	261	2,069	:	:
2003	7,548	:	146	:	295	106	270	1,980	:	:
Other servcies (G-O excl. I)	EU-15	BE	DK	DE*	ES	NL	SE	UK	BG	NO**
1995	20,631	:	:	4,241	880	700	717	3,502	:	:
2000	26,585	649	:	:	1,134	1,320	1,102	6,359	40	446
2001	26,490	652	:	:	1,083	1,205	1,057	6,273	42	585
2002	27,150	660	917	:	1,109	1,218	1,132	6,109	:	:
2003	27,108	:	964	:	1,142	1,165	1,211	5,566	:	:
Transport, storage and communication (I)	EU-15	BE	DK	DE*	ES	NL	SE	UK	BG	NO**
1995	22,017	:	:	3,173	2,033	686	420	4,403	:	:
2000	36,771	1,199	:	:	2,543	887	699	9,283	86	660
2001	36,139	1,203	:	:	2,621	840	643	8,703	123	570
2002	38,258	1,221	344	:	2,887	868	705	9,680	:	:
2003	38,526	:	358	:	3,112	892	739	9,178	:	:
Households	EU-15	BE	DK	DE*	ES	NL	SE	UK	BG	NO**
1995	80,500	:	:	18,045	3,335	2,705	2,707	12,383	:	:
2000	94,556	1,611	:	:	4,853	4,173	3,305	23,629	58	1,461
2001	96,612	1,628	:	:	5,127	4,894	3,202	22,603	85	1,480
2002	96,639	1,638	2,975	:	5,667	5,103	3,407	20,880	:	:
2003	99,303	:	3,000	:	5,781	5,421	3,540	19,064	:	:

* DE includes energy taxes for transport purposes only. **NO preliminary data.

Table 2: Final energy consumption 2003, thousands tons of oil equivalent (TOE)

	EU-15*	BE	DK	DE*	ES*	NL	SE	UK	BG	NO
Business	740,741	28,067	10,643	153,208	76,495	41,036	26,459	106,277	7,094	14,145
Households	262,272	9,865	4,318	76,911	13,768	10,496	7,654	44,324	2,271	3,810

*EU-15, DE and ES provisional value

Table 3: Net disposable income 1995-2003, Million euro

	BE	DK*	DE*	ES	NL	SE	UK*	BG	NO
1995	136,790	68,002	1,239,999	291,517	166,442	97,448	579,395	7,623	54,790
2000	148,422	74,978	1,322,160	392,445	205,198	123,680	1,010,698	7,300	76,570
2001	155,052	79,566	1,374,090	417,093	226,407	123,049	1,054,582	8,371	79,147
2002	157,095	82,312	1,388,530	442,812	231,535	:	1,073,145	:	92,565
2003	157,102	86,383	1,417,730	468,487	230,907	:	1,023,458	:	:

*DK, DE and UK include non-profit institutions serving households in the net disposable income.

Table 4: Transport taxes 1995-2003, Million euro

Agriculture, forestry, fishing (A-B)	EU-15	BE	DK	DE	ES	NL	SE	UK	NO*
1995	403	:	:	55	:	11	36	56	:
2000	559	11	:	42	:	13	63	108	3
2001	514	12	:	44	:	17	59	85	2
2002	670	12	32	:	:	15	63	86	:
2003	791	:	32	:	:	15	63	100	:
Mining and quarrying Manufacturing, electricity, gas and water supply (C-E)	**EU-15**	**BE**	**DK**	**DE**	**ES**	**NL**	**SE**	**UK**	**NO***
1995	1,400	:	:	328	:	67	16	135	:
2000	1,655	74	:	262	:	93	34	237	35
2001	1,617	79	:	298	:	84	32	189	35
2002	1,322	83	47	:	:	77	34	169	:
2003	1,200	:	48	:	:	83	37	150	:
Construction (F)	**EU-15**	**BE**	**DK**	**DE**	**ES**	**NL**	**SE**	**UK**	**NO***
1995	1,247	:	:	266	:	82	28	111	:
2000	1,647	31	:	215	:	112	52	287	28
2001	1,359	33	:	229	:	122	49	139	18
2002	1,259	35	68	:	:	103	52	131	:
2003	1,256	:	69	:	:	94	54	117	:
Other servcies (G-O excl. I)	**EU-15**	**BE**	**DK**	**DE**	**ES**	**NL**	**SE**	**UK**	**NO***
1995	8,769	:	:	1,096	:	1,191	63	1,074	:
2000	11,173	268	:	1,042	:	1,956	117	1,349	420
2001	10,887	281	:	1,219	:	2,122	110	852	505
2002	10,399	296	181	:	:	1,928	117	695	:
2003	11,308	:	185	:	:	2,033	122	664	:
Transport, storage and communication (I)	**EU-15**	**BE**	**DK**	**DE**	**ES**	**NL**	**SE**	**UK**	**NO***
1995	2,067	:	:	411	:	117	31	248	:
2000	2,807	108	:	363	:	150	59	508	145
2001	1,957	118	:	378	:	151	55	121	160
2002	2,152	126	141	:	:	142	59	197	:
2003	2,127	:	144	:	:	157	62	202	:
Households	**EU-15**	**BE**	**DK**	**DE**	**ES**	**NL**	**SE**	**UK**	**NO***
1995	22,527	:	:	4,903	1,513	907	260	3,410	:
2000	32,389	1,084	:	5,091	2,452	1,203	485	6,145	1,495
2001	34,973	1,179	:	6,208	2,565	1,092	456	6,174	1,583
2002	35,598	1,196	1,331	:	2,594	1,129	485	6,483	:
2003	35,794	:	1,221	:	2,768	1,174	505	6,220	:

*NO preliminary data

Table 5: CO_2 emissions for Transport, communication sector 1995-2002, 1000t

	BE	DK	DE	ES	NL	SE	UK	NO
1995	8,362	16,480	32,889	13,510	24,259	12,767	70,100	16,276
2000	8,730	24,541	35,482	17,947	29,398	12,476	89,198	20,124
2001	:	23,433	34,717	:	29,727	:	86,904	21,041
2002	:	25,374	34,676	:	30,066	:	:	:

➢ ESSENTIAL INFORMATION – METHODOLOGICAL NOTES

Environmental Accounts – satellite account to the National Accounts

The central framework - the National Accounts - presents the development of an economy over time. If environmental aspects were directly included in national accounts they would be overburdened with information. A satellite approach is therefore applied, where some conceptual freedoms exist for compiling the accounts. The satellite account, in this case the environmental accounts, can be linked directly with relevant economic and environmental statistics and provides harmonised comparable accounts across any country applying this methodology[1].

Environmental taxes are defined as *a tax whose tax base is a physical unit (or a proxy of it) of something that has a proven, specific negative impact on the environment*[2]. Source of data: Eurostat environmental taxes by industry.

Total Employment (ESA 1995, 11.11-12) covers all persons – both employees and self-employed – engaged in some productive activity that falls within the production boundary of the system. Employees are defined as all persons who, by agreement, work for another resident institutional unit and receive remuneration. Source of data: National Accounts.

National Net Disposable Income (ESA 1995, 8.95) equals net national income (at market prices) minus current transfers (current taxes on income, wealth etc., social contributions, social benefits and other current transfers) payable to non-resident units, plus current transfers receivable by resident units from the rest of the world. Source of data: National Accounts.

Carbon dioxide emissions are calculated by the residential principle following the rules of the national accounts. This means that emissions covered stem from national economic activities and are attributed to these. Source of data: Eurostat NAMEA air.

Final energy consumption include energy consumed in the transport, industrial, commercial, agricultural, public and households sectors but exclude deliveries to the energy transformation sector and to the energy industries themselves. Source of data: Eurostat, Energy statistics.

Statistical classification of economic activities in the European Community (NACE).

A	Agriculture, hunting and forestry
B	Fishing
C	Mining and quarrying
D	Manufacturing
E	Electricity, gas and water supply
F	Construction
G	Wholesale and retail trade; repair of motor vehicles, motorcycles and personal and household goods
H	Hotels and restaurants
I	Transport, storage and communication
J	Financial intermediation
K	Real estate, renting and business activities
L	Public administration and defence; compulsory social security
M	Education
N	Health and social work
O	Other community, social and personal service activities

Data quality

In the National Accounts taxes are not allocated to different industries but deducted from the calculation of GDP as a total. The National Accounts record taxes in the period they accrue. The statistics presented in this SIF follow this principle, but some countries record the taxes on a cash basis. However, the results from each country have been compared with existing statistics and are satisfactory. The allocation techniques are to some extent similar across the countries. Supply and use tables and input-output tables have been used. Some countries also manage taxes by investigating each tax and allocate it to final user that way. The statistics on environmental taxes by industry follows the residential principle of the National Accounts, however in practice it is difficult to properly differentiate taxes paid by residents from those coming in from abroad.

The Harmonised Indices of Consumer Prices (HICP) was used in figure 5 for the deflation of energy taxes to establish the intensity ratio at real prices. The HICP use 2000 as base year and for this publication a transfer to 1995 as base year was done. As only the index itself was available the transfer to 1995 as base year caused some rounding errors. It should be noted that the time frame 1995 to 2000 is short in terms of considerable impact on consumer prices.

Estimations

The EU-15 aggregates for energy and transport taxes have been estimated based on the total revenue provided by the Commission services (Eurostat and Directorate-General Taxation and Customs Union). An average has been calculated and attributed to the appropriate industry.

Other sources

Information about country specific exemptions have been extracted from the OECD/EEA database on instruments used for environmental policy and natural resources management.

Additional country specific information have been extracted from following reports:
Review of Environmental Taxes in the UK Environmental Accounts. ONS 2006.
Norwegian Economic and Environmental Accounts (NOREEA) Project 2003. Statistics Norway 2004.
Environmental taxes and environmentally harmful subsidies. Statistics Sweden 2000.

1. "Handbook of National Accounting – Integrated Environmental and Economic Accounting 2003". United Nations, European Commission, International Monetary Fund, Organisation for Economic Co-operation and Development and the World Bank. 2003 Final Draft

2. "Environmental taxes – A statistical guide". Eurostat. 2001

Further information:

Data: EUROSTAT Website/Home page/Environment and energy/Data

Environment and energy
- Environment
  - Environmental Accounts

Journalists can contact the media support service:

Bech Building Office A4/125
L - 2920 Luxembourg

Tel. (352) 4301 33408
Fax (352) 4301 35349

E-mail: eurostat-mediasupport@ec.europa.eu

European Statistical Data Support:

Eurostat set up with the members of the 'European statistical system' a network of support centres, which will exist in nearly all Member States as well as in some EFTA countries.

Their mission is to provide help and guidance to Internet users of European statistical data.

Contact details for this support network can be found on our Internet site: http://ec.europa.eu/eurostat/

A list of worldwide sales outlets is available at the:

Office for Official Publications of the European Communities.

2, rue Mercier
L - 2985 Luxembourg

URL: http://publications.europa.eu
E-mail: info-info-opoce@ec.europa.eu

The author would like to thank following experts for their valuable comments and insights: Guy Vandille from Federal Planning Bureau Belgium, Ursula Lauber from Statistisches Bundesamt Germany, María Luisa Egido Martín from Instituto Nacional de Estadística Spain, Danguole Krepstuliene from Statistics Lithuania, Christian Ravets, Nikolaos Roubanis and the team of environmental accounts at Eurostat.